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Grotta Mora Cavorso:

Physical, material and symbolic boundaries of life and death practices in a Neolithic cave of central Italy.

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Abstract

Grotta Mora Cavorso is a multi-stratified site located in the inner Apennines in Central Italy. The archaeological deposit found in it spans from Upper Palaeolithic to World War II, and holds one of the largest Neolithic burial deposits currently known in Italy. This work will seek to analyse and interconnect all the pieces of evidence collected during ten years of multidisciplinary investigation at the site, in order to understand several aspects of this peculiar anthropized cave and the wider implications in the whole of the Italian and Mediterranean region, with a specific focus on Neolithic occupation. First of all, we will integrate the data coming from three distinct sectors of the cave which appear to have been used in different ways (Entrance Room for everyday-life activities, Intermediate Room for rituals and Inner Rooms for burials), in the attempt to understand the links between these spaces and to draw a complete picture of the life and death practices during the late 6th millennium BC at Grotta Mora Cavorso. Secondly, through the unique dataset of artefactual, ecofactual, molecular and geological data provided by this cave, we will explore the meaning of such practices in the early Neolithic of Italy and the Mediterranean basin. By combining the DNA, isotope, demographic and morphological data coming from the study of the 28 individuals buried in the cave, we will try to find out whether social selection was already occurring at the time. In addition, spatial studies will allow us to clarify if funerary rituals were disconnected from everyday life or if there was a conceptual and practical continuity between these two aspects of human life. As a final aim for this work, we intend to use Grotta Mora Cavorso and its archaeological potential as an example on how to successfully integrate science and social studies in archaeology, in order to reach deeper understandings of human behaviour in prehistory.

Introduction

Grotta Mora Cavorso (Simbruini Mountains, Central Italy, Fig. 1A) is located 715 m asl and 50 m above the Aniene River, near Jenne (Rome, Latium), and has been known by locals for centuries: they used it as a shelter for flocks of sheep, goats and even cows because of its large and comfortable entrance (Achino et al., 2012). In 2001, the speleological group Shaka Zulu of Subiaco (Rome, Latium) identified and cleared an obstructed secondary tunnel leading to a series of other chambers (Fig. 1B). At this time, they recovered some human bones from the inner rooms, leading to systematic archaeological excavations by the University of Rome "Tor Vergata" since 2006. Ten years of investigation led to the uncovering of a complex and rich stratigraphy (Fig. 1C), spanning between the Pleistocene and World War II, with a peak of anthropization in the early Neolithic period (6th millennium B.C.).

This paper aims to describe and analyse the results of a decade of studies on this site and especially on its Neolithic deposit, which is one of the richest, best preserved and most deeply analysed ones for Italy. By focusing on this specific phase, this study intends to demonstrate how a multi-disciplinary and integrated analysis of different coeval spaces in the same site can lead to a more complex and complete interpretation of the human use of it, by reflecting different practical and symbolic choices of the same community, dealing with the life and death of their members.

Archaeological context

The first room in the cave (from now on called 'Entrance Room'), which measures about 90 m², is virtually divided in two parts, based upon the access of light and to the sudden narrowing of the chamber in the same area. The section close to the entrance was used for several centuries as a domestic animal shelter. Such continued use produced a more disturbed stratigraphy, passing from the modern age directly to the Pleistocene, since the more superficial deposit was removed over time to use the cattle manure for agricultural purposes (Achino et al., 2012). Conversely, the innermost, darker and thus less exposed portion of the entrance chamber still held a well of preserved stratigraphic sequence (Fig. 1C), even if chaotic at the surface level. As reported in Rolfo et al. (2016), this deposit includes:

A) Renaissance and modern layers (Sounding A, external area), with scarce pottery and a few XVII-XVIII centuries coins, hearths and a paved pathway;

B) Contexts of VII-VIII century AD (Sounding B1, Level 1), with scarce pottery, a ceramic oil lamp and a large bronze ring, probably used by shepherds or hermits temporary sheltering in the cave. Hearths and a stone-paved pathway found in the outside area (Sounding A) corroborate this hypothesis;

C) Bronze Age deposits (Soundings B1-D, Level 2), typologically referred to an Early-Middle phase (Protoapennine), with at least two pits, one of them containing an upside-down bowl, a spindle-whorl and a flint blade, and at least one disturbed human burial associated with hundreds of perinatal sheep/goats and pig bones, indicating a ritual and funerary use of the cave in that period[1];

D) Neolithic layers (Soundings B1-D, Level 3; Sounding C; Upper Room, Lower Room; see Table 1), mainly from an Early phase, with remains of hearths, copious pottery, human and faunal remains, as well as scarce bone and lithic industry;

E) Early Holocene layers (Soundings B1-D, Level 4; Lower Room), with wild faunal remains and scarce ash and charcoal;

F) Upper Palaeolithic layers (Sounding B1-2, D, Level 5) with only a few flint objects and abundant wild faunal remains, most of which appear unrelated to the human occupation;

G) Pleistocene layers (Soundings B1-2-3, Levels 6 and 7) with abundant wild animal bone remains and absence of anthropic finds.

The first tunnel is located at the bottom of the Entrance Room. Its deposit showed a similar stratigraphic sequence to the innermost part of the Entrance Room. The tunnel continues for about 6 m, with a downwards gradient of 20°, leading to the first inner room (Intermediate Room) which measures 30 m². This chamber is characterised by layers of calcite concretion alternating with various charcoal layers. Some of them were likely to be proper hearths, dated to the Neolithic and Copper Age, and contained pottery and animal bone fragments. A further passage, 15 meters long, leads to two parallel rooms, the eastern one (Upper Room) being bigger and slightly higher level than the western (Lower Room). These two rooms held the most relevant finds in terms of the wider archaeological framework: the scattered remains of 28

[1]Recent, still ongoing analyses seem to indicate that these deposits may be more complex than previously thought, with a possibly Eneolithic layer being present between the Bronze Age and the Neolithic ones.

individuals of both sexes and every age class were recovered here, and dated to the early Neolithic (Rolfo et al., 2009, 2016). Prior to such a discovery, the area of the Upper Aniene's Valley was considered peripheral; moreover, Neolithic cave burials this consistent are very rare in general (see Discussion for a wider contextualisation of the site), making Grotta Mora Cavorso a key archaeological site for late prehistoric central Italy.

The cave does not end with these rooms, however: the last known chambers have speleothems so beautiful that it was decided to preserve them by not digging in it, and the rest of the cave is blocked by a massive collapse of the vault, preventing further explorations.

Materials and Methods

The investigations carried out at the cave did not simply consist of archaeological excavations. Parallel to such digs, a number of multi-disciplinary analyses and approaches have been employed. Pottery and lithic typo-chronology have been integrated with an extensive study of the faunal and bio-archaeological assemblages. In particular, accurate zooarchaeological analyses (still in progress) contributed to contextualize the human lifeways of the people frequenting Grotta Mora Cavorso, not only for paleoenvironmental and subsistence reconstructions, but also to clarify the ritual choices of these communities (for a similar study related to the Bronze Age deposit see Silvestri et al., 2016, 2017, 2018). In addition, geological investigations were undertaken to understand the dynamics of formation of the cave and their relations with the anthropic frequentation (Rolfo et al., 2012a; 2013) and radiocarbon dates have been produced (Table 1). Furthermore, DNA and isotope analyses on Neolithic human bones have been made (Scorrano et al., 2018). At the same time, molecular studies were carried out on the DNA of volunteers from the village of Jenne and other communities of the Aniene Valley and surrounding areas (Messina, 2015; Rolfo et al., 2011). This experiment was aimed at testing the degree of isolation and external influences occurring amongst these mountain human groups throughout the centuries. Finally, ethno-archaeological methodologies have been employed (Achino et al., 2012; Rolfo et al., 2012b), through video-recorded interviews of the eldest members of the local community with memories of the cave. Archival research was also carried out, mainly using the valuable source of the ancient archive in the close by Santa Scolastica's monastery of Subiaco: a thorough analysis of such resources (dated between the 17th and the 19th centuries) revealed a lack of awareness in (or of interest for) the cave, which was never cited in those documents. This indicates the relatively intact nature of the site, which has not caught the attention of amateurs or clandestine diggers up until now. Apparently, apart from the stabling use made of the entrance, all the inner tunnels and rooms of Grotta Mora Cavorso were sealed at least since late antiquity. Undoubtedly, the second tunnel leading to the Neolithic burials has been left untouched from the 4th millennium BC onwards.

Apart from the continuation of the excavations, which currently focus on the Pleistocene deposits, high-quality spatial and soil micromorphology analyses are in progress. The application of these methodologies will contribute to clarifying the function of the different sectors of the cave throughout the centuries and millennia. In addition, a systematic survey of the surrounding areas (woodlands and caves) and a focus on the human perception of the landscape is ongoing, in order to understand the use of the cave in its wider context and to identify its role in the human networks of prehistoric Central Italy.

Analysis of the Neolithic deposit in the three areas of the cave

Entrance Room (Sounding B1-D)*:*

The only stratigraphically preserved part of the Entrance Room (Fig. 3A), towards the darker and deeper part, revealed the presence of at least two hearths and one pit, around 350 coarse pottery fragments (mainly from jars and secondarily from cups and bowls), two painted *figulina* sherds of the Early Neolithic *Catignano facies*, around 20 bone awls, as many flint tools, two obsidian bladelets and two atrophic deer canines (Fig. 3C). This would already offer several interpretive inputs, but the most interesting one, in this

case, might be the faunal record, quite different in composition and quantity from that found in the inner rooms, although extremely similar to the Intermediate Room. Remains belonging to five cattle, 5 pigs and 11 sheep/goat individuals compose the domestic faunal assemblage, with at least 50% of the pigs and sheep/goats being very young or of perinatal age. Four red deer and three wild boars, certainly related to the human frequentation because of their butchery and cut-marks, make the most of the wild faunal record, which also includes one individual of hare, fox, badger, wildcat and roe deer (Table 2).

Intermediate Room (Sounding C)*:*

The Intermediate Room, completely dark and situated after a tunnel, is located halfway between the cave entrance and the funerary area. Remains of hearths were found in this area, with charcoal patches continuing throughout the tunnel leading to the Inner rooms. Coarse pottery identical to the assemblage from the Entrance Room, an obsidian bladelet (Fig. 3C) and a very similar faunal assemblage to the one revealed by the Entrance Room were found in this chamber. Fourteen sheep/goats, 4 pigs, 2 cattle, red deer and wild boars, as well as an individual of each of the other wild species identified in the cave entrance, compose the faunal dataset of the Intermediate Room (Table 2).

Inner Rooms (Upper and Lower Room)*:*

The Lower Room (Fig. 2A) held around 600 human bones chaotically piled and belonging to at least 28 individuals: 1 fetus, 1 perinatal (<1 year), 5 Infant I (1-6 years), 4 Infant II (7-12 years), 1 Juvenile (13-18 Years), 5 Young Adults (19-30 Years), 2 Adults (31-40 years), 2 Mature adults(41-50 years), and 7 generic adults. Among the sexable individuals, 5 were male, 9 female and 3 were undetermined (Fig. 4). In this sector, shell and stone beads were found, as well as pottery and flint tools, possibly ornaments and grave goods worn by the dead (Fig. 2C). In the Upper Room (Fig. 2B), in contrast, the remains of only three individuals were found, laying directly on a rich-in-charcoal cave floor, and still in partial anatomical connection. The skeletons are thus likely to have been moved from the Upper to the Lower Room either naturally (due to the downwards gradient of the area) or artificially (pushed from one area to the other to make room for new bodies). It is worth to note that a green stone axe (Fig. 2E) was found next to the forearm of one of the primary burials (probably an adult woman); moreover, an almost intact pot (Fig. 2E) and two retouched flint tools were also identified in the same area. Rare and almost exclusively domestic mammals have been identified: the small ruminants are represented by at least 3 adult sheep and 6 young/very young sheep/goats, as well as by one perinatal; a bone of young cattle, one dog bone and two red deer bones complete the assemblage (Salari et al., 2012; Rolfo et al., 2016; Table 2).

Compared to the number of human bones, the grave goods and faunal remains are unsurprisingly scarce, as it is typical for the early Neolithic in Central Italy (Pessina Tinè, 2010), and in the Mediterranean area (Beyneix, 2007, 2008; Guilaine, 1996). However, these finds still provide important pieces of information: for example, the stone of the axe has an Alpine provenience (Mancusi, personal communication from preliminary analysis of the flint and polished stone artefacts), which shows a long-distance direct or indirect goods' circulation. The faunal record, different from the coeval external one, also offers the opportunity to reflect on several aspects of the human occupation of the site.

With regard to the human remains, the presence of several young and very young individuals indicates high mortality rates among the subadults; in addition, the enamel of 12 teeth belonging to at least two individuals shows traces of hypoplasia between the age of 3-5 years (Scorrano et al., 2018). One hypothesis that could link these two pieces of evidence might be related to seasonal difficulties in food procurement. However, the juvenile mortality and the dental stress might also be two independent features of the Grotta Mora Cavorso's community's health. The preliminary results of the DNA analyses show a mixed genetic ancestry for the community members of Grotta Mora Cavorso (partly indigenous, partly with Near Eastern genetic marks) and the isotopic analyses suggest that the diet was mainly based on meat (Scorrano et al.,

2014, 2016, 2018). As expected, no genetic connections were found between the ancient and the modern samples (Rolfo et al., 2011; Messina et al., 2015).

Discussion

Contextual[2] analysis – Part 1: Grotta Mora Cavorso and the Neolithic of central Italy in a Mediterranean framework

Grotta Mora Cavorso is located in a very isolated area of inner Apennine Latium (Central Italy). However, it is placed in a wider geographical area rich in Neolithic sites from the Adriatic to the Tyrrhenian coast, between the caves of the Abruzzi area, such as Grotta dei Piccioni in the innermost part of the region, Grotta Sant'Angelo near to the Adriatic Coast and Grotta Continenza in the Fucino Basin (Cremonesi, 1976; Di Fraia and Grifoni Cremonesi, 1996; Grifoni Cremonesi and Mallegni, 1978). Grotta Beatrice Cenci, slightly farther west, (Agostini et al., 1991), is the closest site to Grotta Mora Cavorso, although mostly known for its Bronze Age deposit, with the Neolithic one being only very briefly cited by the authors. Finally, Grotta Polesini (Radmilli, 1974) and the settlement of Guidonia-Le Caprine (Guidi and Zarattini, 1993) are the closest and most important Early Neolithic sites in the Tyrrhenian side (Fig. 5). None of the funerary caves among the sites cited shows a comparable abundance of burial depositions to Grotta Mora Cavorso, except for the very poorly preserved and investigated Grotta Continenza, which, therefore, cannot provide the same wealth of contextual information. Even by examining further away coeval caves north of Central Italy, such as Grotta Patrizi and Grotta delle Settecannelle (Grifoni Cremonesi and Radmilli, 2001), the importance of the deposit cannot be equated (only 8 burials in each site). Such a disproportion of human presence compared to other caves suggests that Grotta Mora Cavorso did not lie in a marginal –although, at least apparently isolated- position and that it could have represented a central pole of attraction in its territory. This remains valid even if considering the few known Northern Italian Neolithic caves, i.e. Caverna delle Arene Candide (Bernabò Brea, 1956; Tiné, 1999), and Arma dell'Aquila (Sparacello et al., 2018), and those known for Southern Italy, such as Grotta Scaloria, (Robb et al., 2015). The existence of extensive and dynamic interactions between the Grotta Mora Cavorso's occupants and other medium-to-long-distance communities is also corroborated by the wide and varied geographical provenience of the materials found in the cave, which include the Alpine stone axe, the *Catignano* ceramic sherds, the marine shell beads, Sardinian obsidian and flints from the Gargano area of Apulia (Mancusi, personal communication from a preliminary analysis).

Grotta Mora Cavorso appears to maintain its importance even when compared to the wider European -and especially Mediterranean- framework of coeval cave burials. North-Western and Central Europe do not show a significant record of burial caves within the early Neolithic LBK (Linearbandkeramische) culture, with the dead being found especially interred in enclosure ditches, around and under the dwellings, or in open-air cemeteries (Fowler and Scarre, 2015; Hofmann and Orschiedt, 2015). A remarkable exception is Jungfernhöhle Cave (Orschiedt, 1999) in northern Bavaria, where a MNI (Minimum Number of Individuals) of 41 (mainly women and children) was found. Although caves are very common burial sites in the early Neolithic of the British Isles, these are all dated to the late 5th to 4th millennium (Dowd, 2008; Leach, 2008; Sheridan, 2010) because of the late arrival of early farming in this area, which makes any strict cultural comparison inappropriate in this context; the same is valid for Scandinavian Europe (Sjögren, 2015). However, more suitable comparisons can be made with the southern part of the continent, mostly characterised by the Cardial Pottery culture.

For example, Mediterranean France (Beyneix, 2008) shows that 10 out of the only 12 early Neolithic burial deposits known for the area are in caves, although with only few individuals found in each of them. The

[2] To be only loosely intended from Hodder's original sense (1987). This section rather constitutes an effort to integrate all the available pieces of evidence in a macro-scale (part1) and in a micro-scale (part2), in order to get a fuller and more reliable view of past lifeways (as in Darvill, 2008, definition of "Contextual Archaeology").

scarcity of funerary equipment is another shared feature with the Italian context. South-West Europe, e.g. the Catalonia region, appears to be another good source of comparison (north-western Spain's transition to Neolithic occurring later in the 5th millennium, Robb 2015: 972), with several well-studied cave burials dated to the 6th millennium. A striking example is the recently re-analysed and radiocarbon dated Cova Bonica (Vallirana, Barcelona: Oms et al., 2017a), along with Cova Foradada (Calafell, Tarragona: Oms et al., 2016) and Cova de Can Sadurní (Edo et al., 2011, 2017): in these sites, a depositional practice comparable to that of Mora Cavorso Cave has been recognised, with the bodies of all age classes and probably both sexes (Oms et al., 2017a) being laid directly on the cave floor and later moved (causing skeletal disarticulation and bone piling) to make space for the new ones. Although Oms et al. (2017b) raise some doubts about the nature of grave goods of the artefacts found in association with chaotically distributed human bones, they confirm the overall scarcity of these, which is a recurring feature also in other early Neolithic burial sites of the Iberian Peninsula and in the rest of Europe. However, none of these caves exceeds the MNI of 6, making these burial deposits qualitatively very important but, again, quantitatively limited.

Many similarities are also found between Central Italy and South-Eastern Europe (Borić, 2015), i.e. the Balkans and the Carpathian Basin, where early Neolithic burials are still relatively rare, with a prevalence of women over men and of subadults over adults (Lichter, 2001), and with scarce funerary goods, consisting in very few vessels and/or other artefacts (e.g. Cernatul de Jos, Cluj: Comsa, 1974; Franchthi Cave: Jacobsen and Cullen, 1981; Tečić: Galović, 1967) associated to the buried individuals. This scenario, also found in Northern Italian sites, looks very much like that of Grotta Mora Cavorso and the surrounding regions (Southern Italy is more characterised by burials in dwellings but is demographically similar, Robb, 2015, pp. 960-961). Despite the cultural differences with other areas of Europe, there seems to be a common discrepancy between the evidence of numerous and large dwellings compared to the relatively limited known number of dead (van de Velde, 1979; Hofmann and Orschieldt, 2015). In the whole of South-Eastern Europe, the cave site with the largest amount of burial remains counts 23 individuals (Nea Nikomedeia: Borić, 2015), which makes Grotta Mora Cavorso one of the richest early Neolithic burial deposits in caves of Mediterranean Europe.

Contextual analysis – Part 2: The many faces of Grotta Mora Cavorso

The chrono-typological study of the material found in the three areas of the cave suggests that these sectors were used roughly in the same time by the same communities. However, the spatially distinct archaeological deposits and the different contexts of deposition allow for a more complex analysis of the use of the site for different purposes (Fig. 6; Table 3). If, on the one hand, the Inner rooms are undoubtedly dedicated to funerary deposition, with very little evidence of other types of activities than the burial practices repeated over time, the interpretation of the Intermediate and of the Entrance rooms is more complex. Hearths are present in both areas. However, those in the Intermediate Room seem set in a less mundane and more ascetic area, far from the light and closer to the burials. Here, it is most likely that the fires were lit to illuminate the passage but also to light the torches used to get into the innermost tunnels. The action of lighting a hearth in this area cannot have much to do with everyday activities and might be surrounded by a strong magical/religious meaning. The animal bones recovered, if cooked and consumed in loco, were probably processed in a ritual context rather than for merely alimentary purposes (especially since the entrance part of the cave would have been much more comfortable in this sense). Similar evidence is recorded, for example, in the nearby Grotta di Collepardo, although in the Bronze Age (Angle et al., 2010; Skeates et al., in prep.). As for the Entrance Room, it would be easy to classify it as the "domestic" sector of the cave; a wide, sub-horizontal, naturally illuminated area with hearths, cooked and eaten animal food, bone and obsidian and flint instruments both in progress and completed and several cooking pottery sherds: all these finds would indicate a regular everyday life in any human settlement. However, according to the quantity of remains (Table 3), the occupation does not seem to be permanent; at the same time, the cave is not immediately close to any other Neolithic site that could have been a settlement, with the three

closest known ones (Casale del Dolce: Zarattini and Petrassi, 1997; Colle Santo Stefano: Radi, 1991; and Rio Tana: Agostini et al., 2006) being tens of kilometres and days of hiking away, and the last two very close to Grotta Continenza (Fig. 5) . Moreover, the site is not big enough to be inhabited by a community as large as that testified by the relatively high number of individuals buried in the Inner rooms (even if they had been deposited over a long period of time, as preliminarily shown by the ~125-year-long timespan indicated by the radiocarbon datings, see Table 1). Long-distance transhumance is not attested in the early Neolithic, therefore it is unlikely that the cave was a functional temporary stop of a transhumance route, although it seems to be still part of a somewhat geographically-linked cultural route. Finally, the age composition of the faunal assemblage in the Entrance and Intermediate rooms, with a prevalence of sub-juvenile domestic individuals, does not reflect a pattern of flock exploitation related to food production: this is especially valid in the case of the piglets, whose presence is not justified like that of kids and lambs (potentially killed to exploit the dairy products more intensively). The Entrance Room might have thus served as shelter for the most "mundane" part of the community's life during the limited time of the year when the cave was frequented (given the kill-off pattern of the fauna, probably slaughtered during the warmer season), but it must have never been just a simple shepherds' shelter (Bradley, 2005).

The contextual analysis of all these pieces of evidence would, therefore, show a cave which is used in different ways, whose symbolic implications increase by moving towards the darker and deeper areas. If the Entrance Room still maintains some aspects of domesticity, the Intermediate one seems to be both a physical and a metaphorical place of passage from light to dark, from life to death, where preparations for the final ritual of deposition of the dead was taking place. This passage terminates with the Inner rooms, where the dead of the community are left to rest in the peaceful "womb" of the earth.

In line with the trend of Italian Ancient Neolithic burial sites (Robb, 2007), all the demographic segments of a human group are represented in the burial record: men and women, adults, children and even a newborn. This would suggest social equality (Beyneix, 2007).

It is unclear whether Grotta Mora Cavorso was frequented independently from the ritual and funerary use of it, at least during the Neolithic. However, it seems to have represented a key site for the spiritual life of a large community (according to the burial deposit, one of the largest in Neolithic central Italy), or of multiple communities living in a wider region, who chose the cave as the main cemetery for at least a part of their members, probably for over a century (Table 1). Even though it is unlikely that permanent social divisions were already in existence within the human groups of this period (Robb, 2007), it is possible that only a part of the community, maybe the most powerful one or a ritually distinct one (Robb, 2007, p. 62), was allowed to be buried in the cave. This meaningfulness of the buried is not testified by the grave goods, which are rather scarce and are hardly markers of status (Hofmann and Orschiedt, 2015, p. 1026), but by the great energy expenditure involved in transporting the dead at least from the Entrance to the Inner Rooms, crawling in narrow, dark and uncomfortable spaces, carrying a big weight for 50 metres (almost a "reversed birth-giving"). Geologists (Rolfo et al., 2012a; 2013) have stated that the caves' passages have not narrowed down significantly over the past 7000 years, meaning that Neolithic people had to carry the corpses in the same uncomfortable condition of the present day. This kind of effort is not as visible as in the construction of monuments, such as the megaliths typical of a slightly later Neolithic Mediterranean culture (Bradley, 2012), but is still very clear when visiting the cave, even using modern equipment, lighting and body protection.

Conclusions

This paper describes the Neolithic evidence, dating between mid-sixth and late fifth millennia BC, from Grotta Mora Cavorso in Central Italy. This site is an example of how an archaeological site, if scientifically and contextually investigated, can help explain much more than just its artifactual deposit. Unlike many other phases of prehistory, for which there are numerous cases of recently discovered, investigated and interpreted sites, this is one of the rare Italian Neolithic caves that was only identified in the 2000s and

could therefore undergo a multidisciplinary, fully up-to-date analysis. The results of this study improved our understanding of human behaviour in Italy during the Neolithic and offered the opportunity to make a comparison with other significant sites of Europe.

Grotta Mora Cavorso returned a large and well preserved deposit, including human and faunal remains, pottery and lithic industries, ornaments and grave goods. Multidisciplinary analyses were carried out by studying the different areas of the cave both separately and together, with a constant comparative approach. This allowed the identification of the multi-faceted spatial use of this site, which highlighted the striking symbolic functions of the inner areas of the cave, shedding light on the wider social and spiritual dimension of the human lifeways of a community in Neolithic central Italy.

The number of burials, among the highest in European caves for this period, seems to suggest that a single large community or several smaller human groups lived in the surroundings of Grotta Mora Cavorso, perhaps as part of the well-known demographic expansion which took place in the Mediterranean since the 6th millennium B.C. (Bocquet-Appel, 2008; Gronenborn, 2009; Zilhão, 2001). Furthermore, the artefacts coming from a long distance do not only attest to the importance of this cave in an area of the Apennines previously thought to be marginal, but rather encourage a different interpretation of this context as one fully involved in the socio-cultural dynamics of both the West-East and North-South main prehistoric routes of the Italian peninsula.

In conclusion, Grotta Mora Cavorso stands out as a remarkable Neolithic site of the Mediterranean area, with a burial record comparable to those of the richest coeval European cave sites. Further archaeological, bioarchaeological, molecular, taphonomic, spatial and sedimentological studies on the material evidence found in the cave, as well as on the surrounding landscape, will certainly enrich even further our understanding of social systems in central Italy during this complex timeframe.

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Fig.2: A) Plan of Sounding B1; B) Plan of Sounding C; C) 1-2 Retouched flint bladelets; 3 Painted "Catignano style" figulina pottery; 4-6 bone awls; 5 Obsidian bladelet; 7 cylindrical bone artefact (ornament?).

Fig.3: A) Plan of the Lower Room; B) Plan of the Upper Room; C) flint objects: 1-3 Lower Room, 4-5: Upper Room, 6: shell beads; D) Photo of the concreted human bones from Upper Room; E) 7 stone axe; 8 – 9 intact vessels from the Inner Rooms.

Fig.4: Human remains found in the Inner Rooms at Grotta Mora Cavorso, by Minimum Number of Individuals (MNI) and age class (F= Fetus; P= Perinatal, <1 year; I I= Infant I, 1-6 years; I II= Infant II, 7-12 years; J=Juvenile, 13-18; Y-A= Young Adult, 19-30 years; G-A= Generic Adult; A= Adult, 31-40 years; M= Mature, 41-50 years).

Fig.5: The geographical area the known Adriatic and Thyrrenian Early Neolithic sites, with Grotta Mora Cavorso (star) almost in the centre of it.

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Tab.1: Radiometric dating of the Neolithic contexts of Grotta Mora Cavorso.

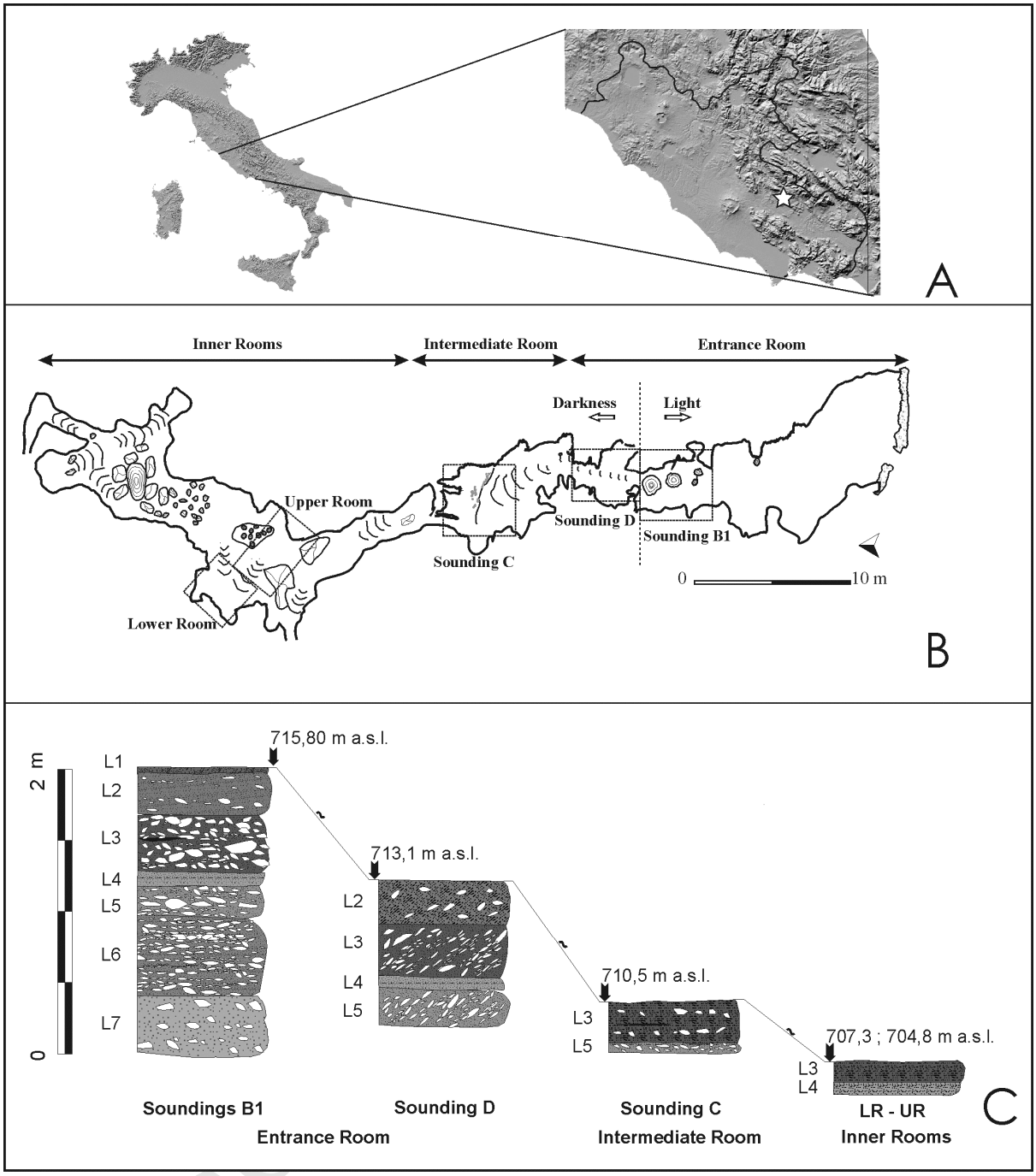
Tab.2: Zooarchaeological remains found in each sector of the Neolithic deposit at Grotta Mora Cavorso, by Minimum Number of Individuals (MNI) and age class (P= Perinatal; VY= Very Young; Y=Young; A=Adult, according to the single species' growth rate; Un=undeterminate age).

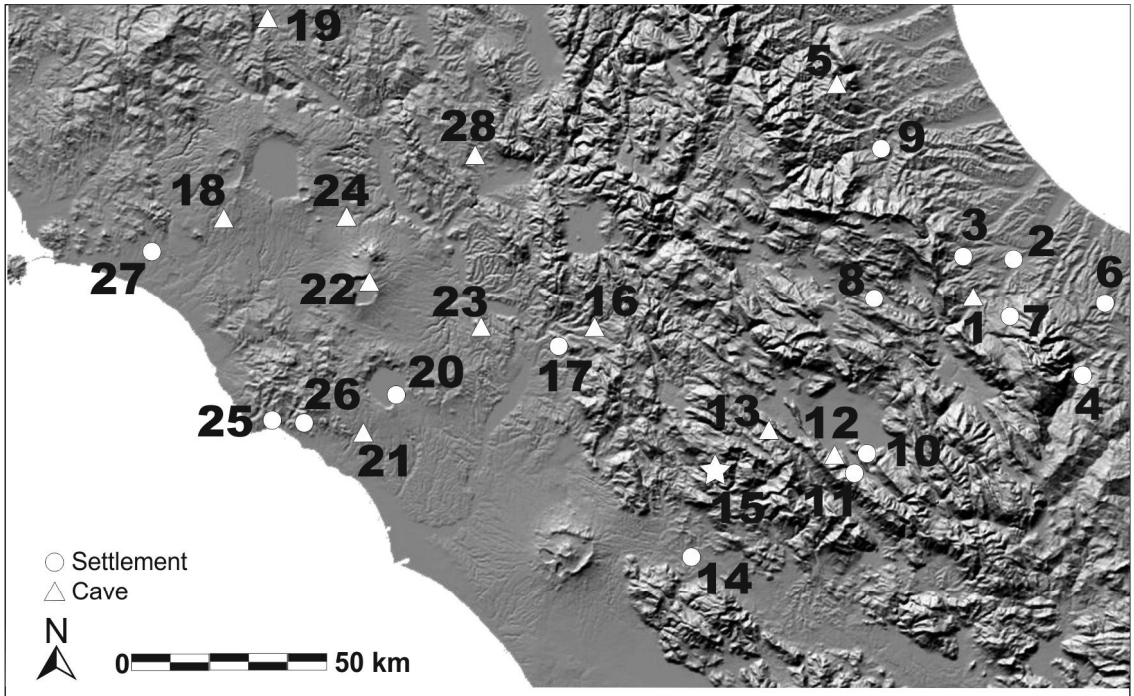
Tab.3: Quantity and distribution of the materials found in each sector of the Neolithic deposit at Grotta Mora Cavorso. For purposes of clarity, the Number of Identified Specimens (NISP) has been provided for the animal remains, while the Minimum Number of Individuals (MNI) has been provided for the human remains.

Laboratory	Context	BP	BC 2σ
Lecce LTL6124A	Cavorso B1/d8 SU300 hearth (charcoal)	6505±50	5560 - 5360
Lyon-3504	Cavorso UR SU1 human bone	6405±35	5472 - 5314
Lyon-5202	Cavorso LW charcoal	6275±45	5322 - 5084
Lecce LTL6123A	Cavorso C/A2 SU22 hearth (charcoal)	6000±45	5010 - 4770
Lecce LTL18072A	Cavorso B1/e13 SU165 animal bone	5205±45	4042 - 3968
Lyon - 5203	Cavorso C/B1 SU6 hearth (charcoal)	4775±35	3640 - 3385

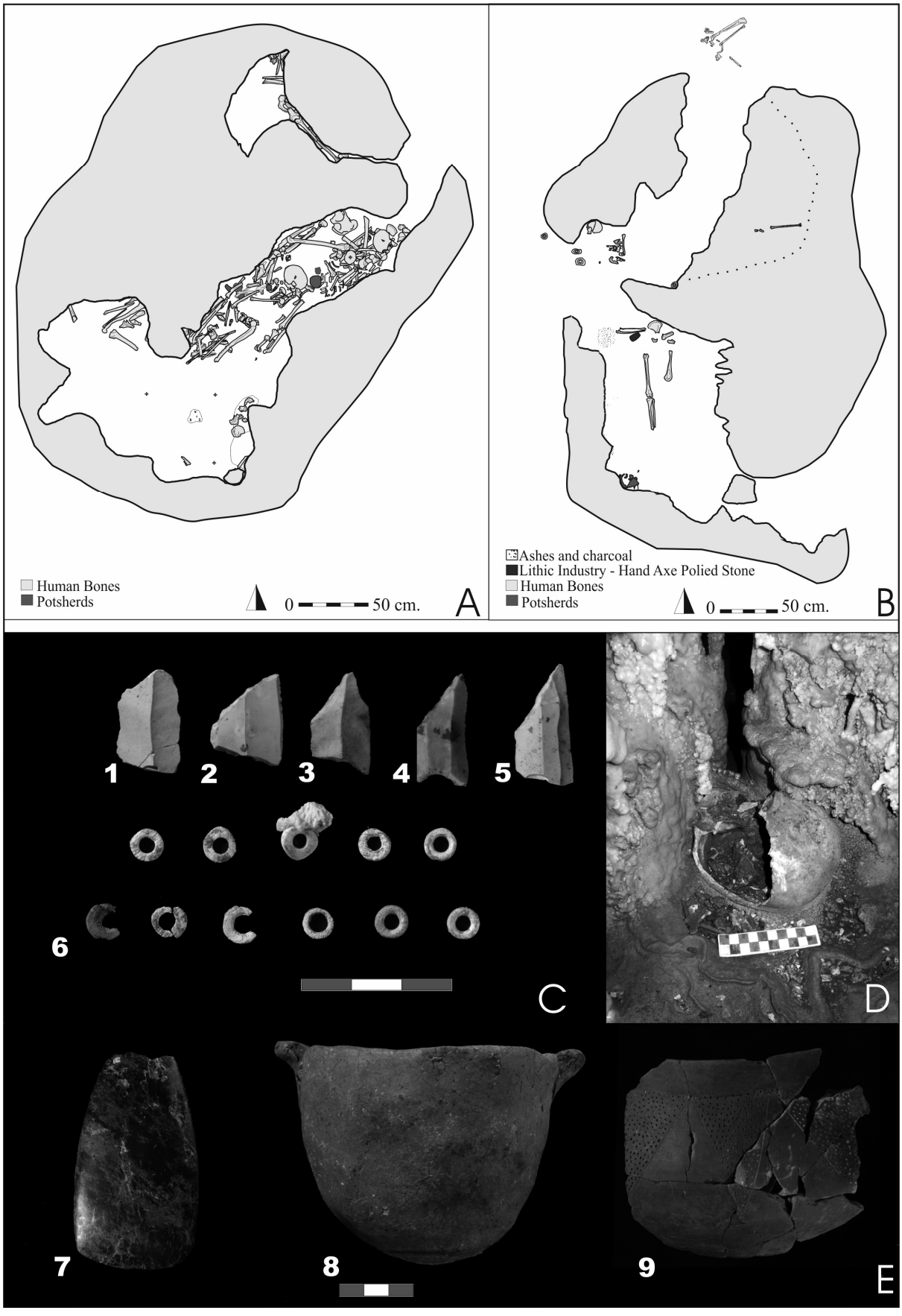
	First Room						Intermediate Room						Inner Rooms					
	MNI	P	VY	Y	A	Un	**MNI**	P	VY	Y	A	Un	**MNI**	P	VY	Y	A	Un
Ovis aries vel *Capra hircus* (Sheep & Goat)	**11**	2	2	4	3		**14**	1	3	6	4		**10**	1	3	3	3	
Bos taurus (Cattle)	**5**			3	2		**2**			1	1		**1**			1		
Sus domesticus (Pig)	**5**	1	1	2	1		**4**	1		1	2							
Canis familiaris (Dog)													**1**				1	
Cervus elaphus (Red deer)	**5**			3	2		**2**			1	1		**1**				1	
Capreolus capreolus (Roe deer)	**1**					1												
Sus scrofa (Wild boar)	**4**			1	3		**2**			1	1							
Vulpes vulpes (Fox)							**1**					1						
Mustelidae	**1**					1												
Meles meles (Badger)	**1**				1		**1**					1						
Felis sylvestris (Wild cat)	**1**				1													
Lepus sp. (Hare)	**3**			1	2		**1**				1							
Total	**37**	3	3	14	15	2	**27**	2	3	10	10	2	**13**	1	3	4	5	0

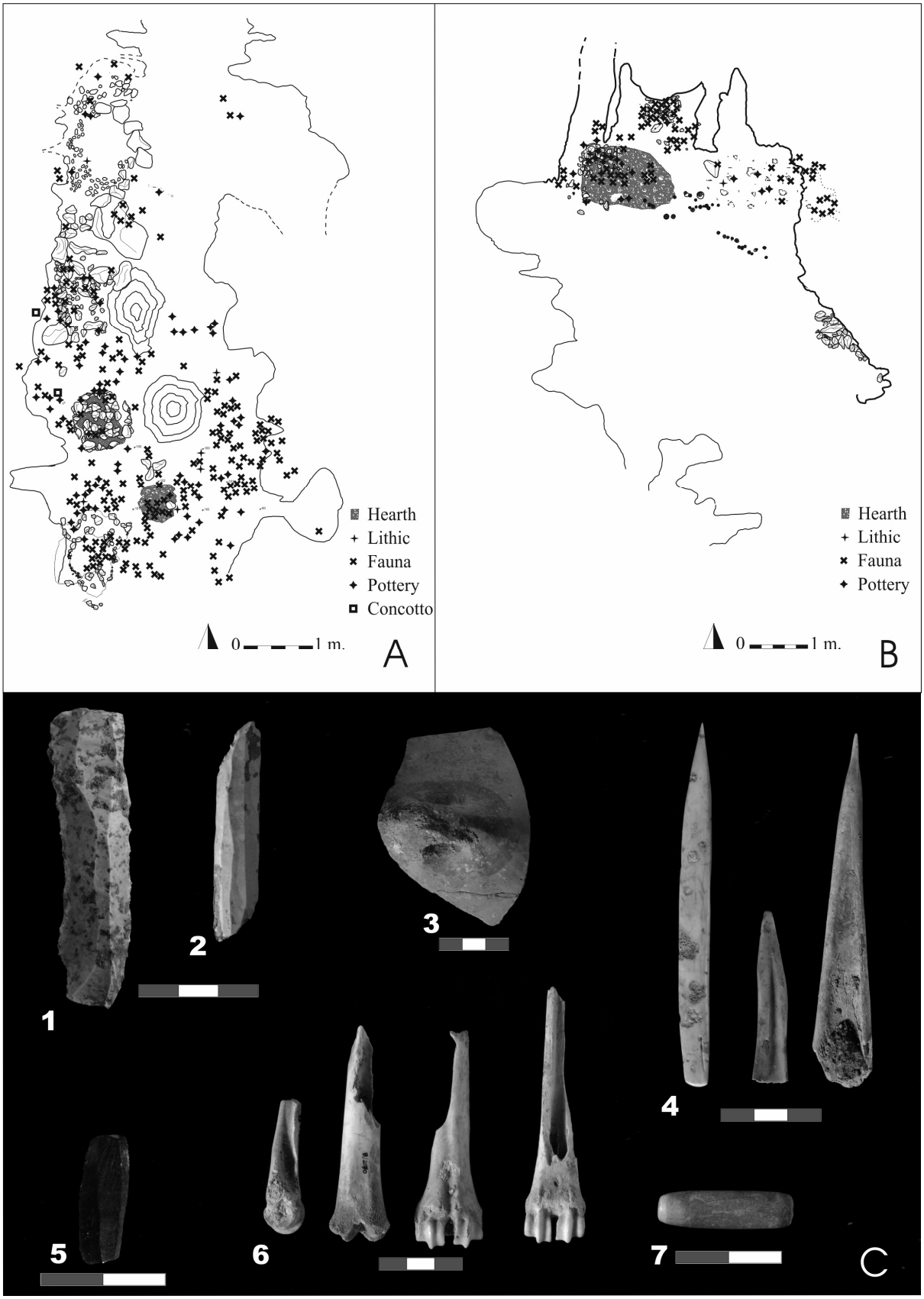
	Entrance Room	Intermediate Room	Inner Rooms	
			Upper	Lower
Pottery fragments	343	67	0	0
Intact (or fully reconstructed) vessels	0	0	1	1
Lithic industry	17	8	2	3
Débitage-Cores	7	3	0	1
Finished tools	10	5	2	2
Polished stone	0	0	1	0
Stone-working tools	2	0	0	0
Shell beads	0	0	0	11
Bone objects	25	4	0	0
Animal bones (NISP)	317	511	11	376
Human bones (MNI)	0	0	3	28


A
Inner Rooms
Intermediate Room
Entrance Room
Darkness
Light
Upper Room
Sounding D
Sounding B1
Sounding C
0
10 m
Lower Room
B
715,80 m a.s.l.
713,1 m a.s.l.
710,5 m a.s.l.
707,3 ; 704,8 m a.s.l.
2 m
0
L1
L2
L3
L4
L5
L6
L7
Soundings B1
Sounding D
Sounding C
LR - UR
Entrance Room
Intermediate Room
Inner Rooms
C



1 - Grotta dei Piccioni ; 2 - Villa Badessa ; 3 - Catignano ; 4 - Fonti Rossi ; 5 - Grotta S. Angelo ; 6 - Tricalle ; 7 - Capo d'Acqua ; 8 - Fonti San Callisto ; 9 - Villaggio Leopardi ; 10 - Colle S. Stefano Ortucchio ; 11 - Rio Tana ; 12 - Grotta Continenza ; 13 - Grotta Beatrice Cenci ; 14 - Casale del Dolce ; 15 - Grotta Mora Cavorso ; 16 - Grotta Polesini ; 17 - Guidonia Le Caprine ; 18 - Grotta Settecannelle ; 19 - Grotta dell'Orso ; 20 - La Marmotta ; 21 - Grotta Patrizi ; 22 - Monte Venere ; 23 - Grotta Antica ; 24 - Grotta del Vannaro ; 25 - Tufarelle ; 26 - S. Pietrino di Rota ; 27 - Poggio Olivastro ; 28 - Grotta Bella


Human Bones
Potsherds
0
50 cm.
A
Ashes and charcoal
Lithic Industry - Hand Axe Polied Stone
Human Bones
Potsherds
0
50 cm.
B
1
2
3
4
5
6
C
D
7
8
9
E


Hearth
Lithic
Fauna
Pottery
Concotto
0
1 m.
A
Hearth
Lithic
Fauna
Pottery
0
1 m.
B
1
2
3
4
5
6
7
C